

# FLUE GUARD AND METHOD OF USE

## FIELD OF THE INVENTION

The present invention relates to the field of a flue guards and more specifically flue guards used in side mounted flues in cold climates, claiming priority from provisional patent application serial number 60/444,711, filed February 5, 2003, and entitled FLUE GUARD AND METHOD OF USE.

## DESCRIPTION OF THE PRIOR ART

The prior art includes variety of vents and covers. One such vent and cover extends vertically through the roadway or pavement for sewers including a cover with opens through which water may flow and yet keep sticks and animals from entering from the vent, as shown in US Patent No. 2,524,242.

Chimney flues also have covers disposed over the vertical chimney flues. See US Patent No. 4,920,867. Another illustration of a vent that permits gas such as air to pass at least one way vertically through a surface is a roof vent to the sewer and carry away sewer gases. Such vents have been covered with screen to keep birds and vermin out. Illustrative of such prior art is the device of US Patent No. 6,244,006.

This has resulted in side flues, which became necessary as furnaces increased in efficiency, not being covered. Vertical flue covers simply are not designed for side flues. The present inventor is unaware of flue guards for side flues either in the market or in the prior art. Animals and birds view the side flues as an excellent place to build a nest. Homeowners have kept the side flues clean, calling in the furnace repairman to

dismantle the furnace and remove the nests, which tend to be built in the furnace near combustion of fossil fuels.

All of such vertical flue covers, while effective for vertical flues are ineffective for horizontal flues. All side flues emit some water vapor, which in cold climates condenses, moves to the bottom of the side flue and starts migrating out of the flue. Some of the water freezes in the process. Flue guards need to avoid being a structure on which ice build up can occur, such that the flue guard does not itself become an obstruction. Animal nest tend to be discovered when the ice may be prevalent, e.g. in the winter when the furnace is being used. A flue guard frozen into the flue is not usable to remove the nests.

What is needed is a flue guard for side flues that may be positioned so as to avoid ice and contain animals and their nests at a point where they can easily be removed from the side flue. Preferably, the flue guard can be inserted sufficiently far into the side flue so as to avoid ice build-up and yet be reached during maintenance. Preferably, the flue guard is positionable above where water collects in a side flue prior to freezing.

## **SUMMARY OF THE PRESENT INVENTION**

The present invention is a flue guard for side flues that may be positioned so as to avoid becoming lodged in ice within the side flue and yet contain animals and their nests at a point where they can easily be removed from the side flue. The flue guard can be inserted sufficiently far so as to avoid ice build-up and yet be reached during

maintenance. The flue guard is positionable above where water collects in a side flue prior to freezing.

The present invention may include use of a tube, side flue, through a wall a building to release gases to the atmosphere outside the building. The invention further has a flue guard having a horizontal concentric tube that lies partially or wholly within the vertical wall of a building. The flue guard may lie axially rotatable within the side flue. The end of the flue guard has a screen which makes it possible to capture and remove the debris left by birds and vermin when the flue guard is removed from the side flue.

Advantageously, the present flue guard is positionable inside a side flue.

Also advantageously, the present side flue is structured to avoid being stuck in ice that forms in a side flue.

As still yet another advantage, the present invention is positioned to avoid being stuck in ice that forms in a side flue.

Further advantageously, the flue guard contains animals and their nests at a point where they can be removed from the side flue without dismantling the furnace.

#### **DESCRIPTION OF THE DRAWINGS**

Figure 1 is a diagram showing a building with a side mounted flue;

Figure 2 is a perspective view of a first embodiment of the flue guard of the present invention;

Figure 3 is a end view of the first embodiment of the flue guard of the present invention;

Figure 4 is a perspective view of a second embodiment of the flue guard of the present invention, showing an elongated body;

Figure 5 is an end view showing either the first or second embodiment of the flue guard of the present invention mounted within a concentric side mounted flue;

Figure 6 is an end view showing either the first or second embodiment of the flue guard of the present invention mounted within a non-concentric side mounted flue;

Figure 7 is a perspective view of a third embodiment of the flue guard of the present invention, showing a stop joined to a second end of the body;

Figure 8 is a partial cross sectional view showing the third embodiment mounted within a concentric flue;

Figure 9 is a side view of a fourth embodiment of the present invention, showing the body slimmed adjacent the exposed end and the stop replaced with a hook; and

Figure 10 is a top view of the fourth embodiment first introduced in Figure 9.

## DETAILED DESCRIPTION

The present invention is a side mounted flue system including a building 10 and a flue guard 30. The flue guard 30 is specially designed to avoid freeze-up problems

that can shut down a furnace, during winter months and control clogging due to animals and birds building nests in the flue system.

The building 10 may be a house, shed, warehouse or other structure in which a furnace is used to maintain the interior temperature. The building 10 has a side flue 12 extending out the side of the building. That is, the side flue extends horizontally out through the side of the building 10 as shown in Figure 1. The side flue 12 may have an end 20 and an interior surface 22. The side flue 12 may be structured in a non-concentric manner such as non-concentric flue 13 shown in Figure 6. Alternatively, the side flue 12 may be concentric, having an inner flue 16 and an outer flue 18 as shown in Figures 5 and 8.

The flue guard 30 may be selectively joined to or adjacent the interior surface 22 of the side flue 12 with the flue guard 30 being positioned predominantly, e.g. entirely or nearly entirely within the side flue 12. The flue guard 30 preferably includes a body 32 with an interior surface 40, an exterior surface 41, a first end 44, a second end 46, and a channel 42 defined therethrough, extending from the first end 44 to the second end 46. The body 32 may be short as shown in Figure 2 or of extended length as shown in Figures 4, 7, and 8. The flue guard 30 may further include fins 34 joined to the body 32 adjacent the first end 44 and at least one stop 36 joined to the second end 46 of the flue guard 30.

Alternatively to a cylindrical body 32, the flue guard 30, shown in Figures 9 and 10, has the body 32 tapered adjacent the second end 46 with the body being C-shaped, e.g. non-contiguous the purpose of which will soon be described. The second

end 46 is further joined to a hook 50. The hook 50 replaces the function of the stop 36. That is, the hook 50 is sized and positioned to hook over the flue lip 20, preventing the flue guard 30 from being pushed too far into the side flue 12. The body 32 is tapered as shown to allow the first end 44 of the flue guard 30 to be positioned sufficiently far into the side flue 12 without unnecessary friction between the flue guard 30 and the side flue 12, making installation and removal for cleaning easier. The body 32 is C-shaped such that the body 32 is above, e.g. does not touch the lower interior surface 22 of the side flue 12, where water and ice are most likely to collect.

The flue guard 30 may be structured or adapted to be inserted into the side flue 12 sufficiently far through the side flue 12 and into the building 10 to avoid collecting frozen condensation on the fins 34 in all natural climates. The exterior surface of the flue guard 30 may be in circumferential contact with at least a portion of the interior surface 22 of the side flue 12. The side flue 12 and the channel 42 may be positioned in a coaxial manner such that air passing through the side flue 12 simultaneously passes through the channel 42. Generally, the fins 34 need to be positioned twelve or more inches within the flue to obtain proper heating. The fins 34 should be spaced close enough together to avoid birds and other small animals from going beyond the fins 34 and into the furnace area. The fins 34 should be thin enough to not obstruct the flow of exhaust away from the furnace area. The stop 36 is of sufficient dimension to engage the end 20 of the side flue 12 to prevent the flue guard 30 from further penetration into the side flue 12 and building 10. That is, the stop 36 remains

accessible such that a user may grasp the stop 36 and pull the flue guard 30 out of the side flue 12 for cleaning and replacement.

In operation, a side flue 12 may be maintained free of debris. The user inserts a flue guard 30 through a side flue 12 and into a building 10. The flue guard 30 should be inserted sufficiently far to position fins 34, which are joined adjacent a first end 44 of the flue guard 30 at a location sufficiently far in the flue 12 to avoid collecting frozen condensation on the fins 34 in all natural climates. The further the fins are positioned within the flue 12 and consequently the building 10, the warmer the building 10 will maintain the fins 34.

The stop 36, which may be joined to a second end 46 of the flue guard 30, may be positioned adjacent an end 20 of the side flue 12. The stop at a later date may be grasped to withdraw the flue guard 30 from the side flue 12. Once removed, the flue guard 30 may be cleaned and washed to remove debris, such as bird and animal nests. After cleaning, the flue guard 30 may be reinserted back into the side flue 12.

Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize changes may be made in form and detail without departing from the spirit and scope of the invention.